



US Army Corps
of Engineers
Rock Island District



Defense Environmental Restoration Program
for
Formerly Used Defense Sites
Ordnance and Explosives

Archives Search Report

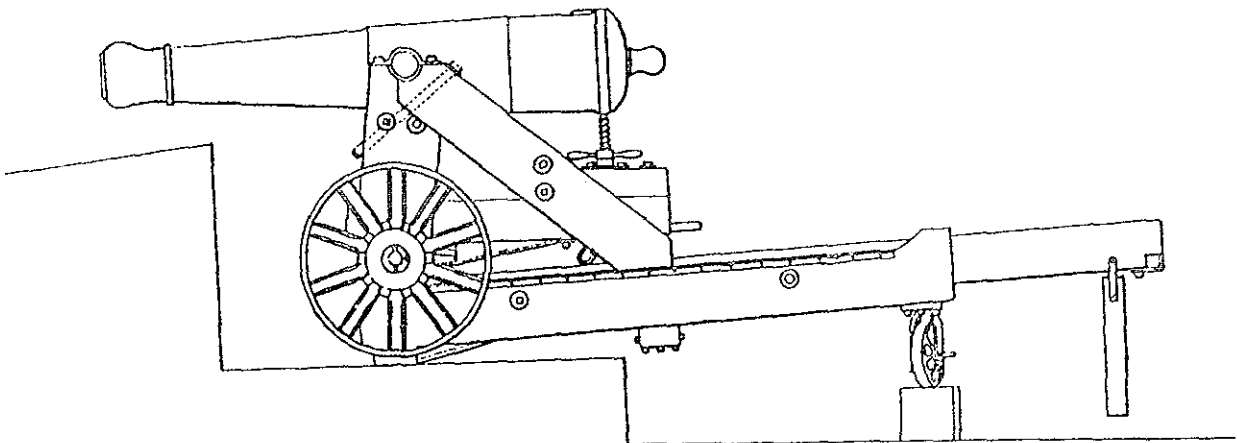
CONCLUSIONS AND RECOMMENDATIONS

for
the former

LITTLE RIVER BATTERY

Belfast, Maine
Project Number D01ME052001

March 1998



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DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
for
FORMERLY USED DEFENSE SITES

CONCLUSIONS AND RECOMMENDATIONS

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
FOR
LITTLE RIVER BATTERY
WALDO COUNTY, MAINE
PROJECT NUMBER DO1ME052001

March 1998

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ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
FOR
LITTLE RIVER BATTERY
WALDO COUNTY, MAINE
PROJECT NUMBER D01ME052001

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ORDNANCE AND EXPLOSIVES
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PROJECT NUMBER D01ME052001

CONCLUSIONS AND RECOMMENDATIONS

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ORDNANCE AND EXPLOSIVES
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FOR
LITTLE RIVER BATTERY
WALDO COUNTY, MAINE
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1. INTRODUCTION

a. **Subject and Purpose**

(1) This report presents the conclusions and recommendations for an historical records search and site inspection for ordnance and explosives (OE) located at the former Little River Battery, Belfast, Maine (see plate 1 for general location map). The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP FUDS).

(2) This investigation focused on four (4) acres of land that were used by the Maine State Militia from approximately 1863 to 1865 as a temporary gun battery to protect the Maine coast against Confederate raiders.

(3) The purpose of this investigation was to characterize the site for potential OE presence, to include conventional ammunition and chemical warfare material (CWM). This investigation was conducted by experienced ordnance experts through thorough evaluation of historical records, interviews and on-site visual inspection results.

b. **Scope**

(1) This report presents the site history, site description, real estate owner information, and confirmed ordnance presence, based on available records, interviews, and the site inspection. It further provides a complete evaluation of all information to assess current day potential ordnance presence where ordnance presence has not been confirmed.

(2) For the purposes of this report, OE presence is defined as live ammunition or components, CWM or explosives which have been lost, abandoned, discarded, buried, fired or thrown from demolition pits or burning pads. These items were either manufactured, purchased, stored, used and/or disposed of by the War Department/Department of Defense.

Such ammunition/components are no longer under accountable record control of any DoD organization or activity.

(3) **Expended** small arms ammunition (.50 cal or smaller), does **not** constitute an OE presence. OE further includes "explosive soil" which refers to any mixture in soil, sand, clays, etc., such that the mixture itself is explosive. Generally 10% or more by weight of secondary explosives in a soil mixture is considered explosive soil.

2. CONCLUSIONS

a. **Summary of Conclusions**

Table 2-1 has been provided to summarize conclusions made on each of the potential OE areas within the former Little River Battery site.

b. **Historical Site Summary**

(1) Prior to 1863

Before 1863, the land comprising Little River Battery and land surrounding the battery was owned by Mr. Erastus Freeman. It is assumed that the land was used as a private residence as available documentation provides no indication of any activities involving ordnance occurring at the site prior to 1863.

(2) 1863 to 1865

(a) On 25 July 1863, CPT Thomas L. Casey of the regular army arrived in Belfast to make arrangements for the construction of additional defenses for Belfast. He selected two sites for temporary batteries - one on the land of Mr. Erastus Freeman, later known as Little River Battery, and one on the opposite shore of Belfast Bay at Minister's Point. A contractor, Mr. Axel Hayford, under the supervision of Mr. Francis E. Appleton of the United States Engineer Corps, immediately commenced construction of the batteries. Both works were completed in November 1863. The method of land acquisition by the State of Maine or the War department is unknown. No deeds, leases, or permits were discovered during the historical records search or site investigation.

(b) Little River Battery and the Battery at Minister's Point were designed to have interlocking fields

TABLE 2-1
SUMMARY OF CONCLUSIONS

Area	Former Usage	Present Usage	Probable End Usage	Size Acres *	FUDS ELIGIBILITY		ORDNANCE PRESENCE			Risk Assessment Code
					Confirmed FUDS	Potential FUDS	Confirmed Ordnance	Potential Ordnance	Uncontaminated	
A	Battery Area	Residential	Same	1	yes	---	---	---	yes	5
B	Remaining Land	Residential	Same	3	yes	---	---	---	yes	5
	TOTAL			4						
C	Firing Fan - Additional Lands	Public waterway	Same	5	yes	---	---	yes	---	3
	TOTAL including additional lands			9						
* Acreages are approximate.										

of fire across Belfast Bay. Each battery was constructed with earth, stone, wood and turf and was 150 feet long with five parapets. Five cannon were mounted on each battery - two 24 pound rifled cannon mounted en barbette and three 32 pound smooth-bore cannon mounted en embrasure.

(c) In addition to the batteries, one magazine per battery was constructed approximately 40 feet to the rear of the parapets. The magazine was pyramidal in form, built of logs, earth and stone, and had walls and a roof that were 10 feet thick. The magazine was completed in November 1863 with the battery, but no ammunition was stored there until sometime after January 1864. Wooden barracks for the troops assigned to the batteries were constructed in June 1864.

(d) Available documentation indicates that several different units occupied Little River Battery from 1863 to 1865. At the end of 1863 after the battery was completed, civilians employed by the government occupied the battery in order to protect the property and to alert the militia in the event of approaching danger. On 18 March 1864, Company A, Coast Guards Infantry was mustered by the State of Maine to defend the two batteries in Belfast. They remained there until 2 May 1864. Later in 1864, Company C, 2nd Division, Maine State Guards, occupied the Little River Battery and the battery at Minister's Point. Lastly, Company F, Coast Guards Infantry were stationed at the batteries in 1865 and were mustered out of the service there on 7 July 1865.

(e) By September 1865, only three (3) guns remained at Little River Battery and the battery was manned by only three (3) soldiers. At this time, it was recommended that the use of the battery be discontinued. In December 1865, the remaining guns at Little River Battery were removed and sent to Fort Knox, Maine, and the battery was dismantled.

(f) The guns at Little River Battery were never fired in an act of war, as the area was not raided by the Confederates. It is unknown whether or not the guns were fired in practice or salute.

(3) 1865 to Present

(a) The area has been developed as a private residential area with primarily summer residences since site closure.

(b) The battery itself has been leveled save the southern corner of the battery. The magazine is still present today, although it has fallen in on itself and is in a state of disrepair. The store house and the barracks no longer remain on the site.

(c) Local law enforcement officials and historians do not know of any incidents involving OE at Little River Battery since site closure.

c. Site Eligibility

(1) Former land usage and ownership of Little River Battery by the War Department has been confirmed and accurately summarized in the COE Findings and Determination of Eligibility dated 26 July 1996.

(2) One additional lands area, Area C, was discovered during the historical records search and site inspection. This area was not addressed in the 26 July 1996 FDE, but is eligible to be included in the DERP FUDS database under current policy.

d. Visual Site Inspection

(1) Little River Battery lies about one mile south of the town of Belfast, Maine on the coast of Belfast Bay. The site is currently used as a residential area with permanent and summer residences. Because the site is a residential area, most of the site has been landscaped and grass has been planted. A fair amount of trees also exist in the area.

(2) Little remains of the battery as it was during the Civil War. Only the southern corner of the battery itself and the magazine still remain, although both are in a state of disrepair. The remainder of the battery has been removed and houses have been built where it once was.

(3) No OE or past evidence of ordnance use was discovered in Areas A, B or C. No incidents involving OE have been reported to the local authorities.

e. Confirmed Ordnance Areas

Confirmed ordnance presence is based on verifiable historical evidence, direct witness, or reliable indirect witness of energetic ordnance items since site closure. There are no areas of confirmed ordnance presence at the Little River Battery site.

f. Potential Ordnance Areas

Potential ordnance areas are based on a lack of confirmed ordnance. Potential ordnance presence is inferred from records or indirect witness. Area C can be considered a potential ordnance area.

g. Uncontaminated Ordnance Areas

Uncontaminated ordnance areas are based on a lack of evidence of confirmed or potential OE presence. Areas A and B can be considered uncontaminated.

h. Other Environmental Hazards

No other environmental hazards related to the Little River Battery are apparent at this time.

3. RECOMMENDATIONS

a. Summary of Recommendations

Table 3-1 represents a summary of recommended actions for the former Little River Battery.

b. Preliminary Assessment Actions

The 26 July 1996 FDE should be corrected to account for Area C, bringing the total acreage from four (4) to nine (9) acres.

c. Ordnance and Explosive Waste Actions

(1) Interim Removal Actions (IRA)

No IRAs are recommended at this time, as there is no evidence of an imminent hazard.

(2) Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA is prescribed in the risk assessment code (RAC) worksheet for Area C due to potential ordnance presence creating a RAC of 3. However, because of mitigating circumstances, a NOFA may be more appropriate. This issue and other issues and concerns for the EE/CA are at Table 3-2.

TABLE 3-1
SUMMARY OF RECOMMENDATIONS

Area	Former Usage	Size Acres*	PA Actions	OE Actions			HTRW Actions	BD/DR Actions
			Prepare INPR	No Further Action	Implement IRA	Perform EE/CA	Perform SI	Perform SI
A	Battery Area	1	---	yes	---	---	---	---
B	Remaining Land	3	---	yes	---	---	---	---
C	Firing Fan - Additional Lands	5	---	---	---	yes**	---	---

* Acreage is approximate.
 ** NOFA may be more appropriate. See Table 3-2.

(3) No Further Action (NOFA)

NOFA is recommended for Areas A and B because there is no historical or present day evidence to suggest that OE exists in these areas.

d. Other Environmental Remediation Actions

No other environmental remediation actions are recommended at this time.

TABLE 3-2 EE/CA ISSUES AND CONCERNS			
Area	Size, Acres	EE/CA Work Item	Issues and Concerns
C	5	Policy Consideration	Area is a water impact area that is subject to tides. Tidal data and water depths should be analyzed to determine whether EE/CA is feasible given current water area remediation guidelines.
		Policy Consideration	OE in area would be from rounds falling short or migrating across the bay floor. Historic documentation does not indicate if practice firing ever occurred. Migration across bay floor is unlikely because of rocky bottom. NOFA should be considered.
		Field Investigation	Area is water impact area. Diving and/or dredging will be required to remediate.
		Field Investigation	Belfast Bay may be subject to high volumes of commercial and recreational boat traffic from Spring to Fall.
		Field Investigation	It is unknown if bay becomes frozen during winter.

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for
Little river Battery
Waldo County, Maine
Project Number D01ME052001

ATTACHMENT A

RISK ASSESSMENT (Little River Battery)

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVES (OE) SITES

Site Name	<u>Little River Battery</u>	Rater's Name	<u>Christopher J. Churney</u>
Site Location	<u>Belfast, ME</u>	Phone No.	<u>(309) 782-1491</u>
DERP Project #	<u>D01ME052001</u>	Organization	<u>CEMVR-ED-DO</u>
Date Completed	<u>6 March 1998</u>	Area	<u>Entire site</u>
Date Revised	<u></u>	RAC Score	<u>3</u>

OE RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OE risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OE hazards identified at the site. The risk assessment is composed of two factors, **hazard severity and hazard probability**. Personnel involved in visits to potential OE sites should view the CEHND video tape entitled "A Life Threatening Encounter: OE."

Part 1. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPES OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	<u>10</u>
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Burstern	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Small Arms, Expended	0
Conventional Ordnance and Ammunition	<u>10</u>
(Select the largest single value)	
What evidence do you have regarding conventional OE? <u>Cannonballs and other Civil War era projectiles potentially exist in Area C.</u>	

A

B. Pyrotechnics. (For munitions not described above)

VALUE

Munition (Container) Containing
White Phosphorous or other
Pyrophoric Material (i.e.,
Spontaneously Flammable) 10

Munition Containing a Flame
or Incendiary Material (i.e. Napalm,
Triethylaluminum Metal Incendiaries) 6

Flares, Signals, Simulators, Screening
Smoke (other than WP) 4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? There is no
evidence of pyrotechnics presence in Areas A, B or C.

C. Bulk High Explosives (Not an integral part of convention ordnance;
uncontainerized.)

VALUE

Primary or Initiating Explosive
(Lead Styphnate, Lead Azide,
Nitroglycerin, Mercury Azide,
Mercury Fulminate, Tetracene, etc.) 10

Demolition Charges 10

Secondary Explosives
(PETN, Composition A, B, C,
Tetryl, TNT, RDX, HMX, HBX,
Black Powder, etc). 8

Military Dynamite 6

Less Sensitive Explosives
(Ammonium Nitrate, Explosive D, etc). 3

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? There is no
evidence of bulk explosives presence in Areas A, B or C.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or
other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants 6

Propellants 0

What evidence do you have regarding propellants? There is no
evidence of bulk propellants presence in Areas A, B or C.

A

E. Chemical Warfare Material and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear)	5
Chemical and Radiological (Select the largest single value)	<u>0</u>
What evidence do you have of chemical/radiological OE?	<u>There is</u>
<u>no evidence of chem/rad presence in Areas A, B or C.</u>	

=====

TOTAL HAZARD SEVERITY VALUE 10
 (Sum of Largest Values for A through E--Maximum of 61).
 Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1
HAZARD SEVERITY*

Description	Category	Hazard Severity Value
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	1 to 4
**NONE		0

* Apply Hazard Severity Category to Table 3.

** If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

A

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other related factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF CONTAMINATION
(Circle all values that apply)

A. Locations of OE Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined locations	4
Inside walls, ceilings, or other parts of Buildings or Structures	3
Subsurface	<u>2</u>
Location (<u>Select the single largest value</u>)	<u>2</u>
What evidence do you have regarding location of OE? <u>under water on the floor of Belfast Bay in Area C.</u>	<u>OE may exist</u>

B. Distance to nearest inhabited locations or structures likely to be at risk from OE hazard (roads, parks, playgrounds, and buildings).

	VALUE
Less than 1250 feet	<u>5</u>
1250 feet to 0.5 miles	4
0.5 miles to 1.0 miles	3
1.0 miles to 2.0 miles	2
Over 2 miles	1
Distance (<u>Select the single largest value</u>)	<u>5</u>
What are the nearest inhabited structures? <u>1250 feet of Area C.</u>	<u>Residences exist within</u>

C. Number of buildings within a 2 mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (Select the single largest value)	<u>5</u>
Narrative	<u>More than 26 buildings are within 2 miles of Area C.</u>

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (Select the largest single value)	<u>5</u>
Describe types of buildings in the area.	<u>Residential, agricultural, educational and commercial buildings are within 2 miles of Area C.</u>

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (of any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated Site	1
a 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility, or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitor, locked entrance, or controlled roadway access to the facility).	0
Accessibility (<u>Select the single largest value</u>)	<u>3</u>
Describe the site accessibility. <u>Any OE in Area C is underwater, so access is limited to diving or dredging operations.</u>	

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Example would be excessive soil erosion by beaches or streams, increasing land development that could reduce distance from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (<u>Select largest value</u>)	<u>0</u>
Describe the site dynamics. <u>Change is not expected at the site. It has been a residential area since site closure.</u>	

=====

Total Hazard Probability Value (Sum of Largest Values for A through F--Maximum of 30)	<u>20</u>
--	-----------

Apply this value to Hazard Probability Table 2 to determine
Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY*

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

* Apply Hazard Probability Level to Table 3.

=====

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR - Recommend further action by CEHND.

RAC 3 Complete INPR - Recommend further action by CEHND.

RAC 4 Complete INPR - Recommend further action by CEHND.

RAC 5 Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that support this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

RAC 3 is indicated for Little River Battery because there is a potential for Civil War projectiles to exist in Area C. Little River Battery was used by the Maine State Militia during the Civil war as a temporary battery to protect the town of Belfast, ME from Confederate raiders. The battery contained 5 cannon (2 rifled 24 pounders and 3 smoothbore 32 pounders) and an earthen magazine. Historic documentation indicates that cannonballs and powder charges were stored in the magazine, but there is no evidence that either remain there today. The cannon were never fired in defense of Belfast. It is unknown whether or not they were ever fired in practice or salute. If fired, rounds could still exist in Area C. According to local historians and local law enforcement officials, no OE has ever been discovered on the site. The SI team found no evidence to suggest a present day OE hazard. The site is considered **potential** and an **EE/CA** is recommended in Area C only. Adjustment of the RAC to a 5 should be considered due to low potential for OE in Area C. See individual area RACs for clarification.

A

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for
Little river Battery
Waldo County, Maine
Project Number D01ME052001

ATTACHMENT B

RISK ASSESSMENT (Areas A and B)

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVES (OE) SITES

Site Name	<u>Little River Battery</u>	Rater's Name	<u>Christopher J. Churney</u>
Site Location	<u>Belfast, ME</u>	Phone No.	<u>(309)782-1491</u>
DERP Project #	<u>D01ME052001</u>	Organization	<u>CEMVR-ED-DO</u>
Date Completed	<u>8 January 1998</u>	Area	<u>Areas A and B</u>
Date Revised	<u></u>	RAC Score	<u>5</u>

OE RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OE risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OE hazards identified at the site. The risk assessment is composed of two factors, **hazard severity and hazard probability**. Personnel involved in visits to potential OE sites should view the CEHND video tape entitled "A Life Threatening Encounter: OE."

Part 1. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPES OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	10
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Small Arms, Expended	0
Conventional Ordnance and Ammunition (Select the largest single value)	<u>0</u>
What evidence do you have regarding conventional OE?	<u>There is no</u>
<u>evidence of conventional OE presence in Areas A or B.</u>	

B

B. Pyrotechnics. (For munitions not described above)

VALUE

Munition (Container) Containing
White Phosphorous or other
Pyrophoric Material (i.e.,
Spontaneously Flammable) 10

Munition Containing a Flame
or Incendiary Material (i.e. Napalm,
Triethylaluminum Metal Incendiaries) 6

Flares, Signals, Simulators, Screening
Smoke (other than WP) 4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? There is no
evidence of pyrotechnics presence in Areas A or B.

C. Bulk High Explosives (Not an integral part of convention ordnance;
uncontainerized.)

VALUE

Primary or Initiating Explosive
(Lead Styphnate, Lead Azide,
Nitroglycerin, Mercury Azide,
Mercury Fulminate, Tetracene, etc.) 10

Demolition Charges 10

Secondary Explosives
(PETN, Composition A, B, C,
Tetryl, TNT, RDX, HMX, HBX,
Black Powder, etc). 8

Military Dynamite 6

Less Sensitive Explosives
(Ammonium Nitrate, Explosive D, etc). 3

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? There is no
evidence of bulk explosives presence in Areas A and B.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or
other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants 6

Propellants 0

What evidence do you have regarding propellants? There is no
evidence of bulk propellants presence in Areas A and B.

B

E. Chemical Warfare Material and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear)	5
Chemical and Radiological (Select the largest single value)	<u>0</u>
What evidence do you have of chemical/radiological OE?	<u>There is</u> <u>no evidence of chem/rad presence in Areas A and B.</u>

=====

TOTAL HAZARD SEVERITY VALUE 0
 (Sum of Largest Values for A through E--Maximum of 61).
 Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY*

Description	Category	Hazard Severity Value
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	1 to 4
**NONE		0

* Apply Hazard Severity Category to Table 3.

** If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

B

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other related factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF CONTAMINATION
(Circle all values that apply)

A. Locations of OE Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined locations	4
Inside walls, ceilings, or other parts of Buildings or Structures	3
Subsurface	2
Location (<u>Select the single largest value</u>)	_____
What evidence do you have regarding location of OE?	_____
_____	_____

B. Distance to nearest inhabited locations or structures likely to be at risk from OE hazard (roads, parks, playgrounds, and buildings).

	VALUE
Less than 1250 feet	5
1250 feet to 0.5 miles	4
0.5 miles to 1.0 miles	3
1.0 miles to 2.0 miles	2
Over 2 miles	1
Distance (<u>Select the single largest value</u>)	_____
What are the nearest inhabited structures?	_____
_____	_____

C. Number of buildings within a 2 mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (<u>Select the single largest value</u>)	_____
Narrative _____	

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (<u>Select the largest single value</u>)	_____
Describe types of buildings in the area. _____	

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (of any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated Site	1
a 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility, or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitor, locked entrance, or controlled roadway access to the facility).	0
Accessibility (<u>Select the single largest value</u>)	_____
Describe the site accessibility. _____	

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Example would be excessive soil erosion by beaches or streams, increasing land development that could reduce distance from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (<u>Select largest value</u>)	_____ 0
Describe the site dynamics. _____	

=====

Total Hazard Probability Value
(Sum of Largest Values for A through F--Maximum of 30) _____

Apply this value to Hazard Probability Table 2 to determine
Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY*

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

* Apply Hazard Probability Level to Table 3.

=====

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR - Recommend further action by CEHND.

RAC 3 Complete INPR - Recommend further action by CEHND.

RAC 4 Complete INPR - Recommend further action by CEHND.

RAC 5 Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that support this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

RAC 5 is indicated for Little River Battery Areas A and B because there is no present day OE hazard at the site. Little River Battery was used by the Maine State Militia during the Civil war as a temporary battery to protect the town of Belfast, ME from Confederate raiders. The battery was constructed of earth, stone and wood in 1863 and contained 5 cannon (2 rifled 24 pounders and 3 smoothbore 32 pounders) and an earthen magazine. Historic documentation indicates that cannonballs and powder charges were stored in the magazine, but there is no evidence that either remain there today. The cannon were never fired in defense of Belfast. It is unknown whether or not they were ever fired in practice or salute. According to local historians and local law enforcement officials, no OE has ever been discovered on the site. The SI team found no evidence to suggest a present day OE hazard. Therefore, Areas A and B can be considered uncontaminated and NOFA is recommended.

B

Ordnance and Explosives
Archives Search Report
for
Little River Battery
Waldo County, Maine
Project Number D01ME052001

ATTACHMENT C

RISK ASSESSMENT (Area C)

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVES (OE) SITES

Site Name	<u>Little River Battery</u>	Rater's Name	<u>Christopher J. Churney</u>
Site Location	<u>Belfast, ME</u>	Phone No.	<u>(309) 782-1491</u>
DERP Project #	<u>D01ME052001</u>	Organization	<u>CEMVR-ED-D0</u>
Date Completed	<u>6 March 1998</u>	Area	<u>Area C</u>
Date Revised	<u></u>	RAC Score	<u>3</u>

OE RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OE risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OE hazards identified at the site. The risk assessment is composed of two factors, **hazard severity** and **hazard probability**. Personnel involved in visits to potential OE sites should view the CEHND video tape entitled "A Life Threatening Encounter: OE."

Part 1. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPES OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	<u>10</u>
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Small Arms, Expended	0
Conventional Ordnance and Ammunition (Select the largest single value)	<u>10</u>
What evidence do you have regarding conventional OE? <u>Cannonballs and other Civil War projos with black powder charges may exist in Area C.</u>	

C

B. Pyrotechnics. (For munitions not described above)

VALUE

Munition (Container) Containing
White Phosphorous or other
Pyrophoric Material (i.e.,
Spontaneously Flammable) 10

Munition Containing a Flame
or Incendiary Material (i.e. Napalm,
Triethylaluminum Metal Incendiaries) 6

Flares, Signals, Simulators, Screening
Smoke (other than WP) 4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? There is no
evidence of pyrotechnics presence in Area C.

C. Bulk High Explosives (Not an integral part of convention ordnance;
uncontainerized.)

VALUE

Primary or Initiating Explosive 10
(Lead Styphnate, Lead Azide,
Nitroglycerin, Mercury Azide,
Mercury Fulminate, Tetracene, etc.)

Demolition Charges 10

Secondary Explosives 8
(PETN, Composition A, B, C,
Tetryl, TNT, RDX, HMX, HBX,
Black Powder, etc).

Military Dynamite 6

Less Sensitive Explosives 3
(Ammonium Nitrate, Explosive D, etc).

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? There is no
evidence of bulk explosives presence in Area C.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or
other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants 6

Propellants 0

What evidence do you have regarding propellants? There is no
evidence of bulk propellants presence in Area C.

C

E. Chemical Warfare Material and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear)	5
Chemical and Radiological (Select the largest single value)	<u>0</u>
What evidence do you have of chemical/radiological OE? <u>no evidence of chem/rad presence in Area C.</u>	<u>There is</u>

=====

TOTAL HAZARD SEVERITY VALUE 10
 (Sum of Largest Values for A through E--Maximum of 61).
 Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY*

Description	Category	Hazard Severity Value
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	1 to 4
**NONE		0

* Apply Hazard Severity Category to Table 3.

** If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other related factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF CONTAMINATION
(Circle all values that apply)

A. Locations of OE Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined locations	4
Inside walls, ceilings, or other parts of Buildings or Structures	3
Subsurface	<u>2</u>
Location (Select the single largest value)	<u>2</u>
What evidence do you have regarding location of OE? <u>Area C is an</u> <u>off-shore area. Therefore OE would be underwater in Belfast Bay.</u>	

B. Distance to nearest inhabited locations or structures likely to be at risk from OE hazard (roads, parks, playgrounds, and buildings).

	VALUE
Less than 1250 feet	<u>5</u>
1250 feet to 0.5 miles	4
0.5 miles to 1.0 miles	3
1.0 miles to 2.0 miles	2
Over 2 miles	1
Distance (Select the single largest value)	<u>5</u>
What are the nearest inhabited structures? <u>Permanent and summer</u> <u>residences exist within 1250 feet.</u>	

C. Number of buildings within a 2 mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (<u>Select the single largest value</u>)	<u>5</u>
Narrative	<u>The town of Belfast exists within a 2 mile radius of the hazard.</u>

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (<u>Select the largest single value</u>)	<u>5</u>
Describe types of buildings in the area.	<u>Residential, agricultural, educational and commercial buildings exist within 2 miles.</u>

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (of any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated Site	1
a 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility, or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitor, locked entrance, or controlled roadway access to the facility).	0
Accessibility (<u>Select the single largest value</u>)	<u>3</u>
Describe the site accessibility. <u>The hazard in Area C is an underwater hazard. Access is limited to diving or dredging.</u>	

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Example would be excessive soil erosion by beaches or streams, increasing land development that could reduce distance from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (<u>Select largest value</u>)	<u>0</u>
Describe the site dynamics. <u>No change is expected to the floor of Belfast Bay.</u>	

20

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

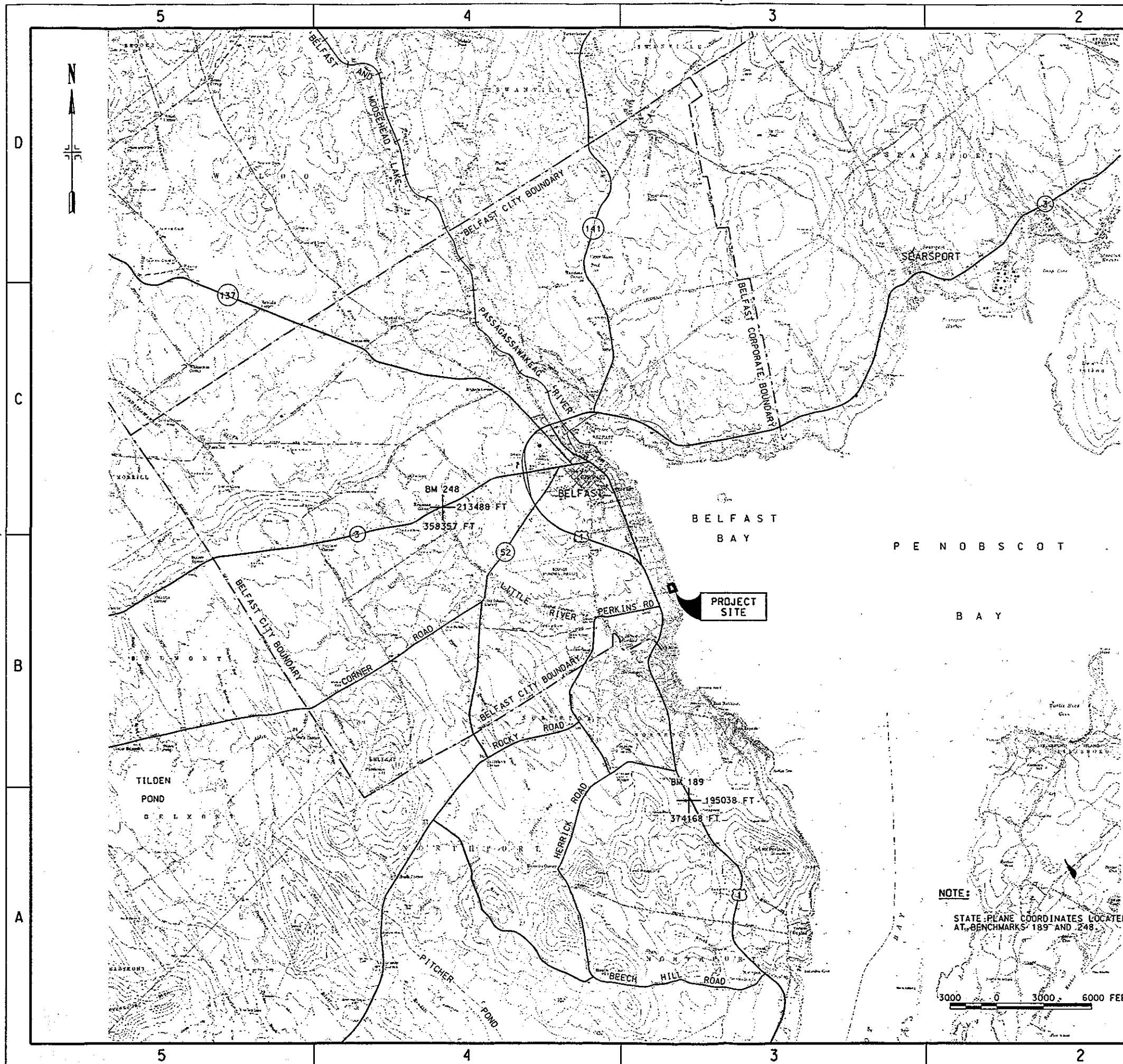
- RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.
- RAC 2 High priority on completion of INPR - Recommend further action by CEHND.
- RAC 3 Complete INPR - Recommend further action by CEHND.
- RAC 4 Complete INPR - Recommend further action by CEHND.
- RAC 5 Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that support this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

RAC 3 is indicated for Little River Battery Area C because there is a slight potential for canonballs and other Civil War era projectiles to exist there. Area C is the firing fan most likely used for practice firing of the 24 and 32 pounder canon; extending only 100 yards into Belfast Bay to account for the current policy regarding off-shore ordnance sites. Historic documentation indicates that the cannon were never fired in defense of Belfast, but there is no record indicating whether or not the cannon were fired in practice. Assuming practice firing did occur, rounds that fell short or migrated along the bottom of Belfast Bay could still remain in Area C. Area C is located near several residences and other commercial and agricultural buildings. However, because the area is underwater, access to the area is limited to divers or dredging operations. There have been no reported incidents since site closure. Because of the potential for OE presence, Area C is considered potential and an EE/CA is recommended. Due to the unlikelihood and uncertainty of OE in the area, NOFA should be considered

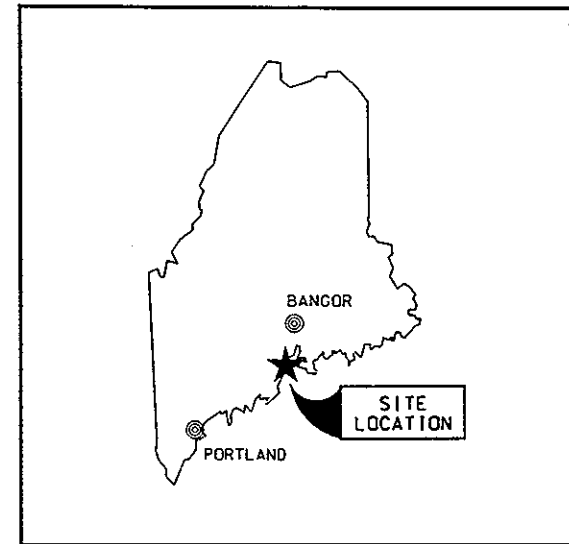
Ordnance and Explosives
Archives Search Report
for
Little River Battery
Waldo County, Maine
Project Number D01ME052001

REPORT PLATES

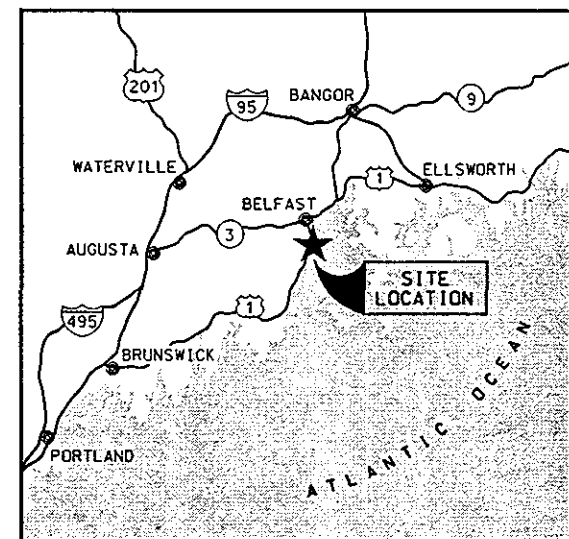


NOTE:
STATE PLANE COORDINATES LOCATED
AT BENCHMARKS 189 AND 248.

3000 0 3000 6000 FEET




STATE MAP OF MAINE

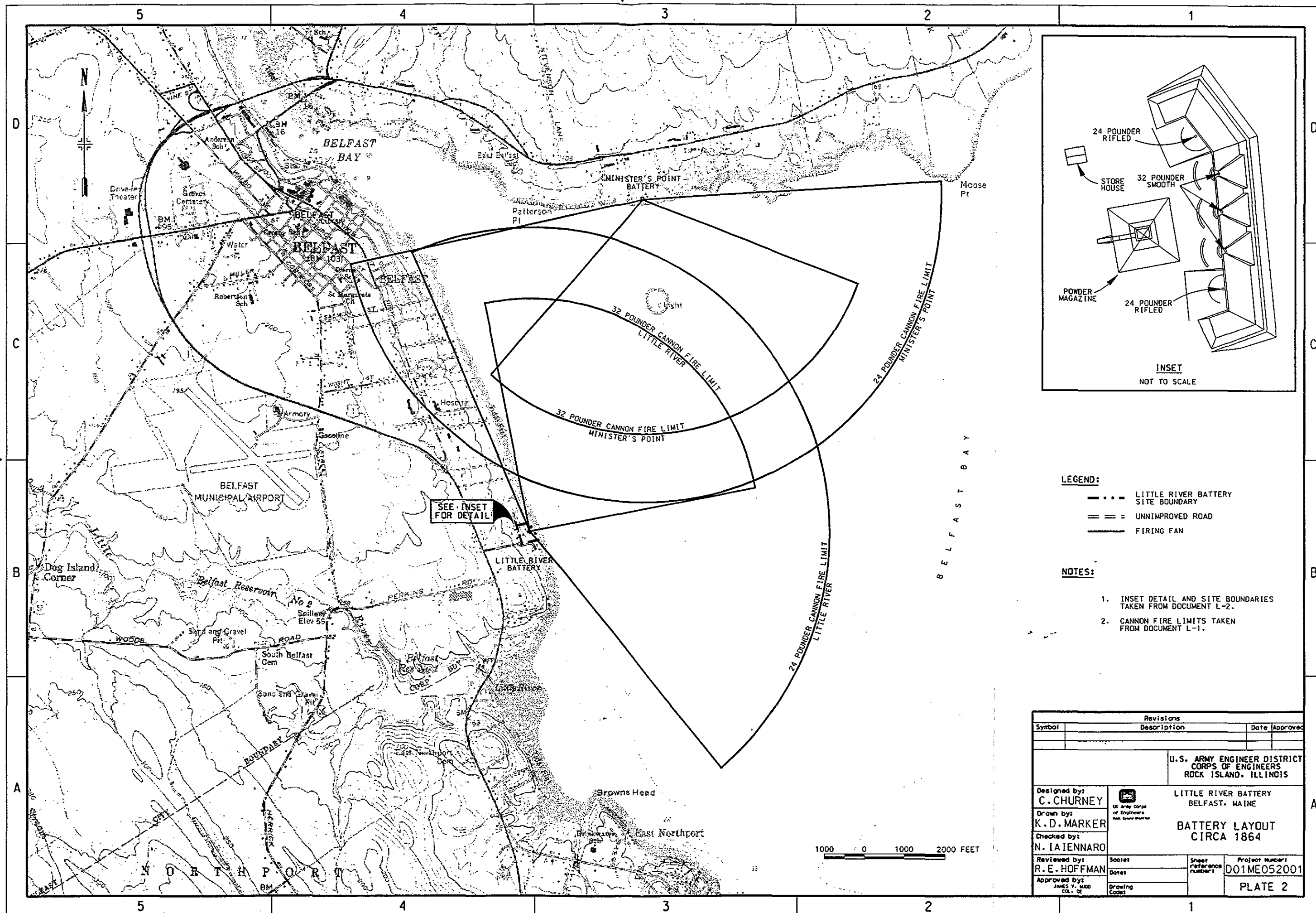



VICINITY MAP

LEGEND:

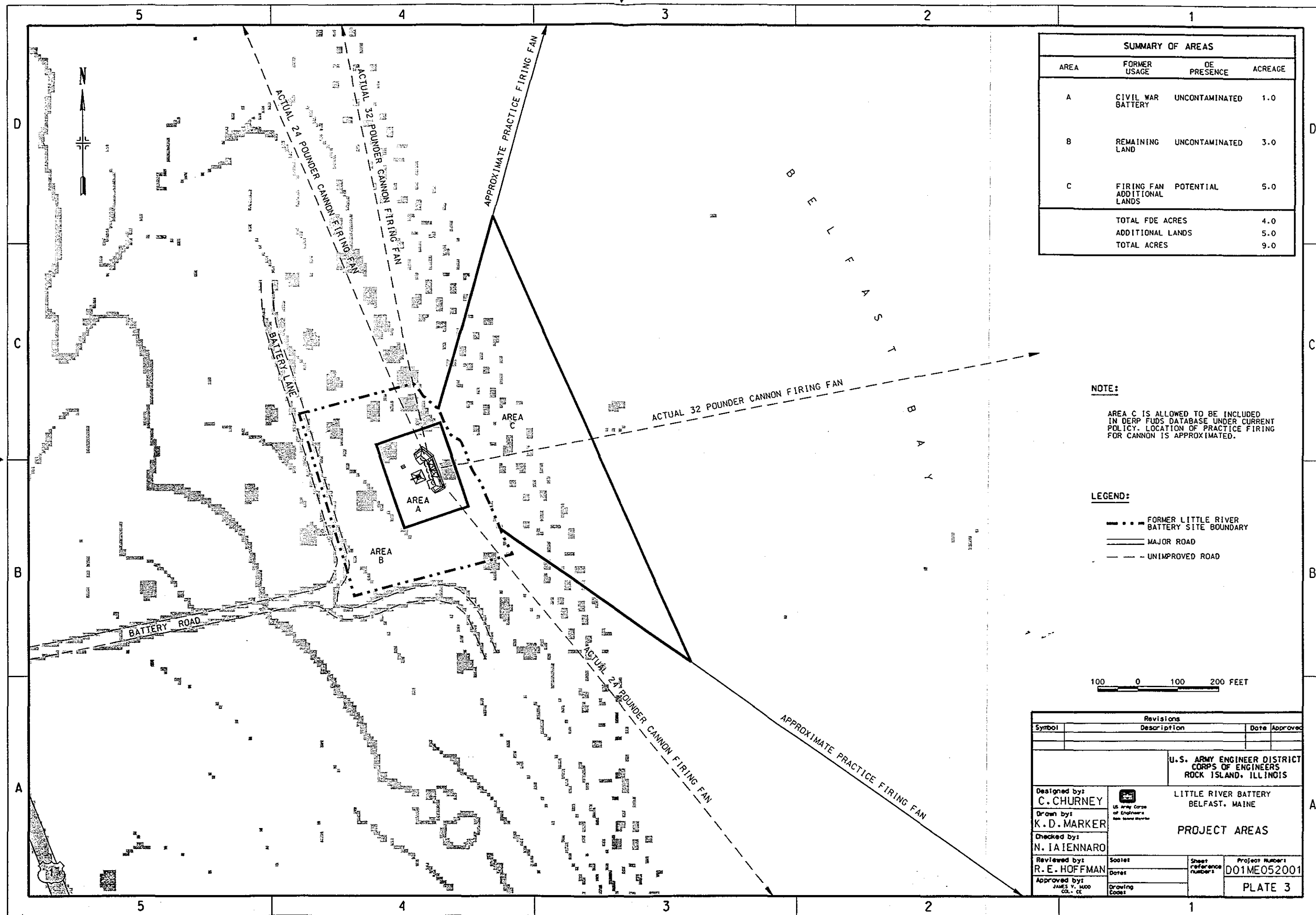
- FORMER LITTLE RIVER BATTERY SITE BOUNDARY
- MAJOR ROAD
- RAILROAD
- - - CITY BOUNDARY
- + STATE PLANE COORDINATE

Revisions			
Symbol	Description	Date	Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by: C. CHURNEY	 LITTLE RIVER BATTERY BELFAST, MAINE SITE MAP		
Drawn by: K. D. MARKER			
Checked by: N. IAIENARO			
Reviewed by: R. E. HOFFMAN			
Approved by: JAMES V. MUD COL. CE	Scale: Date: Drawing Codes:	Sheet reference number:	Project Number: D01ME052001 PLATE 1



Revisions		
Symbol	Description	Date/Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS		
Designed by: C. CHURNEY	 LITTLE RIVER BATTERY BELFAST, MAINE	BATTERY LAYOUT CIRCA 1864
Drawn by: K.D. MARKER		
Checked by: N. IAIENARO		
Reviewed by: R.E. HOFFMAN		
Approved by: JAMES F. MCGEE COL., U.S. ARMY	Soils Date Drawing Code	Sheet reference number 001ME052001 Project Number PLATE 2

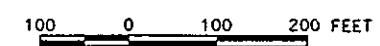
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SUMMARY OF AREAS			
AREA	FORMER USAGE	OE PRESENCE	ACREAGE
A	CIVIL WAR BATTERY	UNCONTAMINATED	1.0
B	REMAINING LAND	UNCONTAMINATED	3.0
C	FIRING FAN ADDITIONAL LANDS	POTENTIAL	5.0
TOTAL FDE ACRES			4.0
ADDITIONAL LANDS			5.0
TOTAL ACRES			9.0

NOTE:
AREA C IS ALLOWED TO BE INCLUDED IN DERP FUDS DATABASE UNDER CURRENT POLICY. LOCATION OF PRACTICE FIRING FOR CANNON IS APPROXIMATED.

- LEGEND:
- FORMER LITTLE RIVER BATTERY SITE BOUNDARY
 - == MAJOR ROAD
 - - - UNIMPROVED ROAD



Revisions			
Symbol	Description	Date	Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by: C. CHURNEY		U.S. Army Corps of Engineers Rock Island District	
Drawn by: K.D. MARKER		LITTLE RIVER BATTERY BELFAST, MAINE	
Checked by: N. IAIENARO		PROJECT AREAS	
Reviewed by: R.E. HOFFMAN		Soilist	Project Number
Approved by: JAMES V. MAO COL, CE		Dates	DD1ME052001
		Drawing Code	PLATE 3

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OWNERSHIP SUMMARY			
TRACT	OWNER	CURRENT USAGE	ACREAGE*
21	PRIVATE (UNKNOWN)	RESIDENCE	0.20
22	PRIVATE (UNKNOWN)	RESIDENCE	0.08
23	PRIVATE (UNKNOWN)	RESIDENCE	0.08
24	PRIVATE (UNKNOWN)	RESIDENCE	0.12
25	PRIVATE (UNKNOWN)	RESIDENCE	0.14
26	DAVID MULTON	RESIDENCE	0.17
27	RICHARD MCCARTHY	RESIDENCE	0.20
28	ROBERT APPEL	RESIDENCE	0.03
29	ALINE BLAUVET	RESIDENCE	0.20
30	HENRY HOWE	RESIDENCE	0.46
30A	JONATHAN KRIEBEL	RESIDENCE	0.35
31	MARTHA CLARK	RESIDENCE	0.80
32	ARTHUR HAYES	RESIDENCE	0.80
—	PUBLIC ROADWAY	ROAD	0.37
TOTAL ACRES			4.00

* APPROXIMATE ACRES


NOTE:

TRACTS TAKEN FROM DOCUMENT G-4.

LEGEND:

- FORMER LITTLE RIVER BATTERY SITE BOUNDARY
- == MAJOR ROAD
- - - UNIMPROVED ROAD

100 0 100 200 FEET

Revisions			
Symbol	Description	Date	Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by: C. CHURNEY	 U.S. Army Corps of Engineers Rock Island District	LITTLE RIVER BATTERY BELFAST, MAINE CURRENT OWNERSHIP 1997	
Drawn by: K.D. MARKER			
Checked by: N. IAIENNARO			
Reviewed by: R.E. HOFFMAN	Scale:	Sheet reference number:	Project Number:
Approved by: JAMES V. MUDG COL, CE	Date:		D01ME052001
	Drawing Code:		PLATE 4

16-MAR-1998 09:33
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